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12 May 1967

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Attention: Dennis R.

Subject:
Task Order No. 18

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Dear Sir:

Enclosed please find three (3) copies of our Eighth Monthly Letter Report on Image Enhancement, covering the period from 1 April 1967 to 30 April 1967, dated 12 May 1967. These reports are being submitted under subject contract.

Sincerely yours,

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PSC/dra
Enclosures (3)

GROUP-1
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Reg. # 1572

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In last month's letter we demonstrated the effectiveness of the Fourier transform hologram — inverse filter recorded on a single piece of film. These one-dimensional filters were constructed with a simulated binary impulse response, a mechanical slit. In the past month we have performed a variation of parameter study on the existing one dimensional filter to determine the optimum exposure ratio between the amplitude mask and the hologram exposed through this mask. We have also designed a liquid gate for this operation which should significantly improve the quality of the optical process by reducing the multiplicative noise.

To follow up our initial success in filter construction with binary impulse responses, we have contracted with a photoetching firm to produce metal masks which should very closely approximate the transmission characteristics of impulse responses generated on the two-dimensional smear generator. Improvements have been made in the operation of the electrical device to insure nearly constant exposure during the smear duration. Early in the coming month, we expect delivery of several masks formed from an assortment of multi-dimensional smears.

In the interim we have added two large volume liquid gates to the spatial filtering bench and are now in the process of determining ratios which yield an optimum signal to noise condition in the one-dimensional filter. We expect this data to be generally applicable to future multi-dimensional filters.

At this time 61% of the contract duration and 61% of the funding has been expended. The progress of the contract has advanced by at least an equal rate. The remaining contractual goals will be applications of the basic results that have been obtained in filter fabrication and impulse response manipulation.